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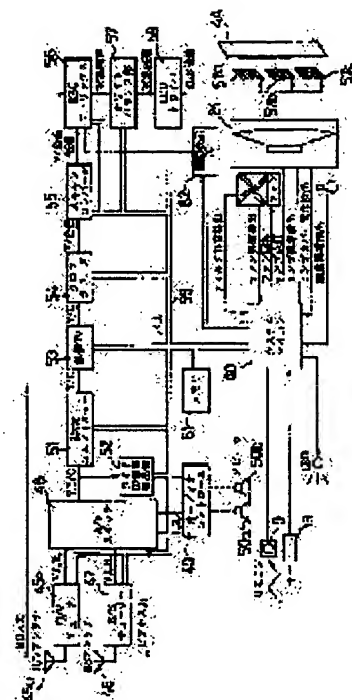
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## (54) VIDEO EQUIPMENT PROVIDED WITH ABNORMAL STATE DETECTION DEVICE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To interrupt power supply or the like on the occurrence of a fault by providing the abnormal state detection device to the video equipment represented by a liquid crystal rear projection television receiver.

**SOLUTION:** An abnormal state of a liquid crystal rear projection television receiver being a video equipment such as a temperature rise, a fault of a fan, a lamp fault, a fault of a lamp cover or a filter is detected (60) and a lamp in response to each abnormal state is lighted. In the case of a faulty lamp, the equipment is started again to confirm the operation and in the case of a faulty filter, a power supply required for video recording when in video recording is not interrupted.



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**CLAIMS**

[Claim(s)]

[Claim 1] The visual equipment equipped with the abnormal-condition detection mechanism which is the visual equipment equipped with the screen which displays an image, and the display which displays the state of a device, and is characterized by turning off the power supply currently supplied to the aforementioned visual equipment when this visual equipment detects a specific abnormal condition.

[Claim 2] The visual equipment equipped with the abnormal-condition detection mechanism according to claim 1 which displayed having turned off the power supply on the aforementioned display by detection of the aforementioned specific abnormal condition.

[Claim 3] The display to the aforementioned display by detection of the aforementioned specific abnormal condition is the visual equipment equipped with the abnormal-condition detection mechanism according to claim 2 characterized by changing a display state according to the kind of detected abnormal condition.

[Claim 4] The visual equipment equipped with the abnormal-condition detection mechanism which is the visual equipment equipped with the air-intake which incorporates the open air from the tooth back of a screen through a filter to the lamp house equipped with the lamp for the light sources which projects light, the fan who cools the optical unit for projection generating heat, and this fan, and is characterized by turning off the power supply currently supplied to the aforementioned visual equipment when this visual equipment detects a specific abnormal condition.

[Claim 5] The visual equipment equipped with the abnormal-condition detection mechanism according to claim 4 characterized by preparing the display which displays having turned off the power supply by detection of a specific abnormal condition on the aforementioned visual equipment.

[Claim 6] The display to the display by detection of the aforementioned specific abnormal condition is the visual equipment equipped with the abnormal-condition detection mechanism according to claim 5 characterized by changing a display state according to the kind of abnormal condition which carried out [ aforementioned ] detection.

[Claim 7] The kind of abnormal condition which the aforementioned visual equipment detects is the visual equipment equipped with the abnormal-condition detection mechanism according to claim 4 it was made to contain the abnormalities in temperature, the abnormalities in a fan, the abnormalities in a lamp non-switched on the light, and the abnormalities in a filter at least.

[Claim 8] The visual equipment equipped with the abnormal-condition detection mechanism according to claim 7 characterized by operating lamp re-starting before turning off a power supply when it reaches when a power supply is turned on in the aforementioned visual equipment, or the power supply is turned on, and the aforementioned abnormalities in a lamp non-switched on the light are detected.

[Claim 9] The visual equipment equipped with the abnormal-condition detection mechanism according to claim 7 in which it was made not to drop the power supply related to this videotape recording when the aforementioned abnormalities in a filter were detected and the aforementioned visual equipment was recording on videotape.

[Claim 10] The aforementioned visual equipment is a visual equipment equipped with the abnormal-condition detection mechanism according to claim 4 which is liquid crystal rear-projection television.

[Claim 11] The aforementioned liquid crystal rear-projection television is the visual equipment equipped with the abnormal-condition detection mechanism according to claim 10 characterized by attaching so that the lamp house equipped [ of the main part ] with the lamp for the light sources from the front face can be exchanged.

[Claim 12] It is the visual equipment equipped with the abnormal-condition detection mechanism according to claim 10 characterized by preparing the air-intake which incorporates the open air through the filter which can detach [ of a main part ] and attach the aforementioned liquid crystal rear-projection television freely from a front face.

[Translation done.]

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention is the thing equipped with the mechanism in which an abnormal condition is detected about visual equipments, such as a television receiver, a monitor, and a projector. more in a detail To the image equipment which projects light from the tooth back of a screen and can begin to copy an image, for example, the interior, the liquid crystal display section A visual equipment including (calling it LCD hereafter), the optical unit containing a projector lens, The light source, a mirror, etc. are equipped and it is related with the abnormal-condition detection mechanism prepared in the liquid crystal rear-projection television receiver (henceforth liquid crystal rear-projection television) by which the screen was attached in the upside front-face side.

[0002]

[Description of the Prior Art] The visual equipment in the conventional technology, for example, liquid crystal rear-projection television, is easier to enlarge than the television receiver using the Braun tube by lessening depth and being able to make a screen large, for example, it is the common knowledge which is shown in drawing 12 as a conventional example.

[0003] As shown in drawing 12 , the liquid crystal rear-projection television 1 consists of an up cabinet 2 and a lower cabinet 3, and has structure which formed the screen 4 arranged in the front-face side, and the mirror 5 which irradiates the beam of light of an image at a screen 4 inside the up cabinet 2.

[0004] Although not illustrated with the optical unit 7 which equipped the lower cabinet 3 with the projector lens 6, and the lamp house section 8 which equipped this optical unit 7 with the lamp for the light sources which irradiates light, it has structure which prepared the control section which controls the optical unit 7.

[0005] Although the lamp house section 8 is not illustrating, since the lamp which contained the lamp made to generate light in the interior, among those it had generates high temperature, as it is contained from the tooth-back side of liquid crystal rear-projection television and cannot be exchanged easily, it is planning the safety of the user of liquid crystal rear-projection television.

[0006]

[Problem(s) to be Solved by the Invention] However, liquid-crystal rear-projection television which is a visual equipment in the conventional technology which gave [ above-mentioned ] explanation carried the optical unit which is easy being influenced by temperature while generating high temperature, and even if it was the case where temperature becomes easy rising by the elevation more than setting temperature, the abnormalities of a fan's idle state and the lamp for floodlighting non-switched on the light, etc., the trouble referred to as that the means cope with it is not given was.

[0007] Moreover, although it is not the life of the lamp itself even if it compares and is making it detect the abnormalities in a lamp non-switched on the light, the unreasonableness referred to as turning off a power supply immediately poses a problem.

[0008] Furthermore, it compared, when it was [ BS ] under videotape recording and a filter was removed while a visual equipment drives for example, even if it was the composition equipped with the air-intake which incorporates the open air through a filter from the exterior, in order to cool the optical unit which generates high temperature, the power supply was turned off immediately, and there was un-arranging [ which it is referred to as also stopping BS videotape recording on the way ].

[0009] Therefore, it has the technical problem which must be solved about the method of the management at the time of detecting detection of the abnormal condition of a visual equipment, for example, liquid crystal rear-projection television, and an abnormal condition.

[0010]

[Means for Solving the Problem] The visual equipment equipped with the malfunction detection mechanism

concerning this invention in order to solve the above-mentioned technical problem is a visual equipment equipped with the screen which displays an image, and the display which displays an image state, is having turned off the power supply, when this visual equipment's detected a specific abnormal condition, and when an abnormal condition is detected, it indicates that it turned off the power supply. This display is having changed the display state according to the kind of abnormalities.

[0011] Moreover, it is the visual equipment equipped with the duct which sends air into the lamp house equipped with the light source which projects light, the fan who cools the projection equipment generating heat, and a fan through a filter from the tooth back of a screen, for example, liquid-crystal rear-projection television, and when this visual equipment detects a specific abnormal condition, it is having turned off the visual equipment and it makes the composition which prepared the display which indicates that the abnormal condition of a visual equipment was detected and it shut off the power supply. According to the kind of abnormal condition, a display gives change to a display state, and the kind of this abnormal condition is made the composition which contained the abnormalities in temperature, the abnormalities in a fan, the abnormalities in a lamp non-switched on the light, and the abnormalities in a filter at least.

[0012] Thus, if the abnormal condition produced with the visual equipment by constituting is detected The power supply currently supplied to the control section relevant to the part which generates high temperature, such as an optical unit which performs an image fundamentally, and a lamp house, etc. is turned off. While being able to display that now on Light Emitting Diode etc., and a user understanding simply the cause that the power supply was turned off, and also degrading the performance of the visual equipment itself is lost, it can be promptly coped with to each abnormal condition.

[0013]

[Embodiments of the Invention] Next, drawing is made reference about the operation gestalt of liquid crystal rear-projection television which is tooth-back irradiation type image equipment about the visual equipment equipped with the abnormal-condition detection mechanism concerning this invention, and it explains to a detail below. In addition, it is given and explained to the same thing as the conventional technology that the same number is easy to understand.

[0014] Liquid crystal rear-projection television 1A consists of up cabinet 2A and lower cabinet 3A, as shown in drawing 1 , drawing 2 , and drawing 3 .

[0015] The rectangle-like frame section 10 is formed in the front-face side, and, as for up cabinet 2A, screen 4A is attached in this frame section 10. And as shown in drawing 3 , it is formed in the shape of [ by which the interior is a cavity as the whole and the circumference was blocked with the upper surface wall 11, both the side wall 12, the tooth-back wall 13, and the base wall 14 ] an enclosed type, and mirror 5A is attached through the plinth inside the tooth-back wall 13.

[0016] Lower cabinet 3A is equipped with all the required devices as liquid crystal rear-projection television 1A except for screen 4A and mirror 5A which were prepared in the aforementioned up cabinet 2A. For example, optical unit 7A equipped with the visual equipment and projector lens which include LCD and a drive circuit as the main composition section is arranged in the abbreviation center section.

[0017] The light source section 15 and loudspeaker 16a are arranged in a right-hand side position (seeing from a transverse plane in this example right-hand side) from the center section by the side of the front face of lower cabinet 3A shown in drawing 2 , and it has structure covered by grill 18a for [ which has many bores / 1st ] a bandage from on the.

[0018] As Above LCD is shown in drawing 3 , what is generally used as the so-called optical unit 7A which enabled it to also control the color concentration of RGB including a projector lens is adopted, and that to which the drive circuit carried two or more required electronic parts in the printed circuit board is adopted.

[0019] As the light source, the highly efficient degree discharge lamp of luminosity (it sets in the example and is a HID lamp / 100W) is used, for example, the whole is made into a cartridge-type, and it enables it to have exchanged simply the whole lamp house equipped with the lamp from the front-face side of a liquid crystal rear-projection television 1A main part. About the lamp house equipped with this lamp for the light sources, it mentions later in detail.

[0020] In drawing 2 , the air-intake 17 for cooling loudspeaker 16b and internal optical unit 7A (referring to drawing 3 ) on the left-hand side of the front-face side of lower cabinet 3A is formed, and it has screened by 2nd grill 18b which is a panel from the top and has many bores. In addition, although not illustrated, the air from an air-intake 17 has structure which is ventilated by the fan who prepared in the interior and cools optical unit 7A. An intermediary also mentions later in detail at this point.

[0021] While the control-panel section 19 is attached a little in a right-hand side position from a center section at the front-face side of lower cabinet 3A and various kinds of operations can carry out manually, it enables it to also have performed operation (to refer to drawing 1 ) by remote control (the so-called remote control) 9 in drawing 1 and

drawing 2 .

[0022] In the control-panel section 19, as shown in drawing 1 , it has the display which consists of a Light Emitting Diode, and has at least composition equipped with power supply Light Emitting Diode 19a which displays ON/OFF of the power supply of liquid crystal rear-projection 1A, standby Light Emitting Diode 19b, and BS power supply Light Emitting Diode 19c, and while each is functioning, the light is switched on. Furthermore, when the specific abnormal condition mentioned later is detected, these Light Emitting Diodes 19a, 19b, and 19c have composition easily understood what kind of abnormal condition it is by check by looking with the combination which lights up and blinks. in addition, the physical relationship of these Light Emitting Diodes 19a, 19b, and 19c comes out not to mention the ability to change suitably

[0023] Thus, as shown in drawing 2 , the light source section 15, Loudspeakers 16a and 16b, and an air-intake 17 are changed into the state where it was extensively covered by the 1st for makeup and the 2nd grill 18a and 18b which were arranged in the front-face side free [ attachment and detachment ], and was screened, and have improved appearance.

[0024] While being able to renew easily the lamp house equipped with the lamp for the light sources of the light source section 15 by removing the 1st by the side of a front face, and the 2nd grill 18a and 18b, without, shifting the position in which liquid crystal rear-projection television 1A was installed on the other hand, or making it move, the filter of an air-intake 17 also has structure which can be exchanged easily.

[0025] This light source section 15 is formed in the front right-hand side position of lower cabinet 3A of liquid crystal projection TV 1A, as shown in drawing 4 . The lamp house hold section 21 fixed by positioning in the light source hold section 20 prepared in the lower cabinet 3A main part, It consists of the 1st grill 18a which has the bore of the lamp house 22 equipped with the high intensity discharge lamp 24, the protective cover 32 which indicated handling essential points etc., and a large number which served also as audio passage and the passage of air.

[0026] The lamp house hold section 21 is formed with the adiathermancy material of an abbreviation square configuration, the basket type configuration is carried out, and the window part 23 for optical paths of a rhombus configuration and the other 3 sides have structure which prepared many bores of a predetermined size to the direction to attach at the left-hand side side.

[0027] Make it the same and it is formed in a square configuration. a lamp house 22 is shown in drawing 4 -- as -- the configuration of the lamp house hold section 21, and abbreviation -- the adiathermancy which forms successively left lateral [ of the direction to hold ], and front-face sides right-angled, forms them, and supports a lamp 24 -- with the lamp supporter 25 of a member The handle section 28 equipped with the handle 27 which is the front-face side of the lamp supporter 25, and was really formed by the same adiathermancy member, It consists of the lamp covering sections 30 which it is formed with metallicity material, and the right lateral, the tooth back, flat surface, and base of a direction to hold become a right angle respectively, and become each from many bores 29 and which were formed reticulated.

[0028] The glass side of the front face of a lamp 24 has structure which formed the window part 31 of the circle configuration which carries out engagement support as faces outside at the lamp supporter 25.

[0029] A handle 27 is the upper part of a position which indicated the handling of a lamp 24, and has structure formed a little in the right-hand side position from the upper part and lower part side from the mid gear at the abbreviation semicircle-like blind hole configuration. The handle 27 made into such structure inserts an index finger from down while inserting the thumb from above at one of the two of a right hand or a left hand, and it has the structure where the back portion of other fingers is applied near the position which indicated the handling of a lamp 24, and the handling of extraction and insertion etc. can do it. That is, it will be in the possession state stabilized when it is made the structure which has a handle 27 by the thumb and the index finger, and it was dealt with with other fingers, and it had \*\*\*\*\* structure and it had a lamp 24, and has the structure of making the handling of a lamp 24 prudent.

[0030] The light source section 15 which consists of such structure makes a lamp house 22 put in and engage with the light source hold section 20 which arranged the lamp house hold section 21 of a liquid crystal projection TV 1A main part from a front-face side, as shown in drawing 4 . At this time, although not illustrated, it has structure which the connector which supplies a power supply to the lamp 24 formed in the tooth back of a lamp house 22 connects with a main part. And it will be in the state where the lens side which a lamp 24 irradiates faced through the window part 23 for optical paths. And the method of a wrap of the lamp house 22 is carried out, and a protective cover 32 is attached, and from on the, 2nd grill 18a which is a panel is assembled, and it completes. Thus, the lamp house 22 equipped with the lamp 24 for tooth-back irradiation is made into cartridge form, and structure which an amateur also takes out and inserts simply and can exchange [ of liquid crystal rear-projection television 1A ] from a front face is realized.

[0031] And although not illustrated, the lamp 24 is cooled outside, a fan being attached in the up position of the lamp house hold section 21, inhaling the open air from the 1st grill 18a, and hitting to a lamp house 22, since high

temperature is generated, as it missed outside.

[0032] Next, air is taken in through a filter from the front-face side of liquid crystal rear-projection television 1A, and the duct structure which cools an optical unit is explained.

[0033] That is, as shown in drawing 5 and drawing 6, on the left-hand side of the front-face side of lower cabinet 3A, it has loudspeaker 16b and structure which formed the air-intake 33 for cooling internal optical unit 7A (referring to drawing 6).

[0034] It has structure which the filter 34 from which dust, dust, etc. are removed was formed in the air-intake 33, and was close to the back side and formed the duct 35 with a grid. It has screened by 2nd grill 18b which is the upper shell panel of this air-intake 33, and has many bores.

[0035] Thus, while being able to renew easily the lamp house 22 equipped with the lamp 24 for the light sources of the light source section 15 by removing the 1st by the side of a front face, and the 2nd grill 18a and 18b, without shifting the position in which liquid crystal rear-projection television 1A was installed by having exchanged the lamp house 22 and the filter 34 from [ of a main part ] the front face, or making it move, the filter 34 of an air-intake 33 can also be exchanged easily.

[0036] As shown in drawing 6, a cutting plane is formed in a rectangular telescopic configuration, the air inlet edge 36a side is opening cut in the direction which intersects perpendicularly to the direction of a cylinder, the air-outlet edge 36b side is opening cut in the direction of slant to the direction of a cylinder, and the duct 35 with a grid has structure which formed the grid section 37 in the interior.

[0037] The grid section 37 is formed in the direction of the back at the pyramid type configuration made into the shape of a grid, and the grid member and the airstream way are formed in the state where it inclined. Therefore, while being able to take the large airstream road surface product which passes a grid member, it has the structure where a finger etc. cannot be caught easily.

[0038] The duct 35 with a grid which carried out such structure is formed between the air-intake 33 of the frame prepared in the front-face side which forms lower cabinet 3A of the main part of liquid crystal rear-projection television, and the duct engagement section 41 which sends air into the airstream way 40 which is the posterior part tooth-back side of lower cabinet 3A, and was formed with the tooth-back supporter 38 and the diaphragm 39, as shown in drawing 6 and drawing 7. And the outside of an air-intake 33 is equipped with a filter 34, 2nd grill 18b (refer to drawing 5) is put from on the, and the assembly of an air breathing part is completed.

[0039] If it does so, air is sendable into the airstream way 40 which air prepared between the tooth-back supporter 38 and the diaphragm 39 through the duct 35 with a grid attached in the air-intake 33 by sticking. That is, in drawing 6, a fan 44 is attached in the fan engagement section 43 prepared in the diaphragm 39, and a wind is sent into optical unit 7A which exists in a fan's 44 direction of a wind (the direction of an arrow), and it can cool.

[0040] On the other hand, filter 34 the very thing is not necessarily driven electrically, and an electrical circuit etc. does not exist around a filter 34. That is, even if it energizes, there is no possibility of an electric shock. Moreover, a user is asked to clean a filter 34 periodically at an operation manual etc. Here, although cleaning of a filter 34 is performed in the state of "the power supply end", it is possible not to necessarily be displayed on an exterior screen by the inside of videotape-recording mode, for example, BS videotape-recording mode, and to remove a filter 34 in BS videotape-recording mode, since it is the same as that of the state of the "power supply end." Therefore, it has composition which does not turn off a power supply required for videotape recording though the metaphor filter 34 is removed in BS videotape-recording mode so that it may mention later.

[0041] Next, about the internal structure and abnormal-condition detection mechanism of optical system in liquid crystal rear-projection television 1A which consists of the above-mentioned structure, drawing is made reference and explained.

[0042] A user operates liquid crystal rear-projection television 1A with the control panel 19 currently installed in remote control 9 or the main part, as shown in drawing 1. And the result is reflected in the display screen according to the content of operation. Moreover, there is a Light Emitting Diode in the front face of a main part, and it has composition which usually displays the state of a power supply.

[0043] Moreover, it generates by optical unit 7A, and is reflected by mirror 5A, and the image projected is projected on screen 4A, and makes the screen which a user looks at.

[0044] The internal structure of the optical system of liquid crystal rear-projection television 1A which consists of composition of such the whole As shown in drawing 8, U/V antenna 45a and U/V tuner 45b, The BS antenna 46, a broadcasting satellite tuner 47, and the AV switch 48, The audio control 49, Loudspeakers 50a and 50b, and the 3-dimensional COM filter 51, The wide ID signal-detection section 52, and extension TV 53 and the chroma decoder 54, It consists of a scan converter 55, the RGB matrix 56, the white balance section 57, the LCD driver 58, the LCD panels 57a, 57b, and 57c, the lamp 24 for the light sources, screen 4A, a bus line 59, and a system microcomputer 60.



[0045] U/V tuner 45b tunes in the signal received by U/V antenna 45a which receives a ground wave, and a broadcasting satellite tuner 47 tunes in the signal which received the satellite wave with the BS antenna 46.

[0046] The AV switch 48 inputs the video signal tuned in with U/V tuner 45b and the broadcasting satellite tuner 47, a sound signal, the video signal from a video input terminal, and a sound signal, and outputs one selected.

[0047] The audio control 49 controls the sound signal (L, R) of the right and left chosen by the A/V switch 48, and outputs a sound signal from the loudspeakers 50a and 50b on either side.

[0048] The 3-dimensional COM filter 51 inputs the video signal chosen by the A/V switch 48, and divides it into a luminance signal and a chrominance signal.

[0049] The wide ID signal-detection section 52 detects the wide ID signal on which it is superimposed in the vertical-retrace-line section out of the video signal chosen from the AV switch 48.

[0050] Extension TV 53 performs decoding of the discernment control signal of extended television, and a reinforcement signal from the luminance signal extracted with the 3-dimensional COM filter 51, and a chrominance signal.

[0051] The chroma decoder 54 restores to the luminance signal and chrominance signal of a video signal which decoded the discernment control signal and the reinforcement signal by extension TV 53 to Y/color-difference signal.

[0052] Since interlace scanning is impossible in the case of a liquid crystal display, Y/chrominance signal to which it restored by the chroma decoder 54 are changed into \*\*\*\*, and a screen display changes 4:3 into the aspect ratio of 16:9, and a scan converter 55 performs zoom processing etc.

[0053] The RGB matrix 56 inputs the RGB code for a tubular surface display which changes into the RGB code of \*\*\*\* Y/color-difference signal \*\*\*\*(ed) by the scan converter 55, and is outputted from a change and a screen display IC with the video signal from HD input terminal, and superimposes it on the RGB code of an image.

[0054] The white balance section 57 performs white balance adjustment of the RGB code to which it \*\*\*\*(ed) by the scan converter 55, and superposition etc. was carried out by the RGB matrix 56.

[0055] White balance adjustment is carried out, and the LCD driver 58 supplies and controls the \*\*\*\*(ed) RGB code by the white balance section 57 on three LCD panels 57a, 57b, and 57c.

[0056] Screen 4A passes the irradiation light of a lamp 24, and copies out the image which passed from three LCD panels 57a, 57b, and 57c and these LCD panels 57a, 57b, and 57c for RGB.

[0057] On the other hand, each component which gave [ above-mentioned ] explanation is controlled by the system microcomputer 60 through the bus line 59. That is, the channel selection information by the remote control 9 or the control panel 19 from a user has the composition of it being inputted into the system microcomputer 60 and performing various control through a bus line 59.

[0058] The information which the system microcomputer 60 needs for various control is stored in the memory 61 connected to this bus line 59. For example, adjustment data, such as screen distortion, such as screen mode specified by the user, a channel, an input change, and volume, are also stored here.

[0059] The system microcomputer 60 which performs control of these various kinds controls Light Emitting Diodes 19a, 19b, and 19c of the lamp 24 (refer to drawing 4 ) of the light source section 15, a fan 44 (refer to drawing 6 ), and a control panel 19 while controlling each composition through a bus line 59.

[0060] Furthermore, while controlling a lamp 24, a fan 44, and Light Emitting Diodes 19a, 19b, and 19c, the malfunction detection mechanism which consists of filter malfunction detection, fan malfunction detection, lamp malfunction detection, temperature malfunction detection, etc. at least is controlled.

[0061] And it can point to the system microcomputer 60 through a bus line 59 to the tubular surface display IC 62, it can make the RGB code for a tubular surface display able to output, and can make a superposition display etc. perform suitably on screen 4A.

[0062] The detection mechanism of an abnormal condition with the system microcomputer 60 which consists of such composition has composition which carries out operation of shutting off a power supply, and gives an indication according to various kinds of abnormal conditions while detecting various kinds of abnormal conditions.

[0063] The display of various kinds of abnormal conditions is expressed in the combination of a display of three Light Emitting Diodes 19a, 19b, and 19c (refer to drawing 1 ) currently installed in the control panel 19 of the front face of liquid crystal projection TV 1A. These Light Emitting Diodes 19a, 19b, and 19c usually display the state of a power supply. That is, although mentioned above, power supply Light Emitting Diode 19a is turned on when a power supply is turned on. Standby Light Emitting Diode 19b is turned on when a set power supply is standby. BS power supply Light Emitting Diode 19c is turned on when BS power supply is turned on. Using such a Light Emitting Diode, expression is changed and each abnormal condition is displayed.

[0064] Hereafter, about detection of various kinds of abnormal conditions, and the display when being detected, the flow chart view shown in drawing 9 is made reference, and is explained. If the abnormalities in temperature or the



abnormalities in a fan are detected, a main part will be turned off and Standby Light Emitting Diode, a power supply Light Emitting Diode, and the BS power supply Light Emitting Diode will be blinked the period of 1Hz (Steps ST1, ST2, and ST3). And a user cannot return to normal. It is necessary to fix with service. It detects that the fan prepared in the fan 44 and about 22 lamp house which are shown in drawing 6 may not rotate according to a certain cause, and these fans do not rotate fan malfunction detection normally.

[0065] The abnormalities in temperature are the fans prepared in the fan 44 and about 22 lamp house, and even if it cools the interior of liquid crystal rear-projection television 1A especially optical unit 7A, and the light source section 15 (refer to drawing 4 and drawing 6), the temperature in liquid crystal rear-projection television 1A may become high unusually. By a lamp 44 generating heat unusually, it is thought that it is bad as cooling in fan 44 grade is air. Therefore, temperature malfunction detection detects that the temperature in liquid crystal rear-projection television 1A is high unusually.

[0066] In a step ST 4, if the abnormalities in a lamp non-switched on the light are detected, a main part will be turned off and Standby Light Emitting Diode and a power supply Light Emitting Diode will be blinked the period of 1Hz (Steps ST5 and ST6).

[0067] every lamp house 22 into which, as for the lamp abnormal condition non-switched on the light, the user reput the power supply or which was equipped with the lamp 24 at the time of the life of a lamp 24 -- exchanging (referring to drawing 4) -- it becomes normal Standby Light Emitting Diode and a power supply Light Emitting Diode are blinked with the period of 1Hz at the time of this abnormality.

[0068] Gas is enclosed with inter-electrode and this lamp 24 has the structure where gas emits light, by discharging by inter-electrode. In the lamp 24 which consists of such structure, inter-electrode gas is distributing uniformly at the time of "the power supply end." And AC high voltage of \*\*25kv is first applied at the time of starting of a lamp 24. Then, gas is ionized by inter-electrode and begins luminescence. Then, AC high voltage is lowered and it will be in the state of stable luminescence. In spite of having applied AC high voltage of \*\*25kv at this time, ionization of gas is not performed well and may not emit light. At this time, "lamp lighting" is cut and it waits for a while, and re-starting cannot be performed if inter-electrode gas will be distributed uniformly.

[0069] Moreover, when AC hits are during lamp lighting, it discharges by inter-electrode, AC high voltage falls, and a bird clapper is to "lamp" un-switch on the light. This state is inputted into the system microcomputer 60 by "lamp malfunction detection." Re-starting cannot be performed, if "lamp lighting" was cut also at this time, it waited for it for a while and will be uniformly distributed by inter-electrode gas.

[0070] Although it is the latency time from which inter-electrode gas will be distributed uniformly, if it is made the end out of lamp lighting, it will take about 30 seconds. Since ionization of gas is the middle when "lamp" starting goes wrong, it takes about 15 seconds. in addition, time to return comes out not to mention not being limited to these Since a "lamp" may be un-switching on the light by the life, all must make re-starting several times. About this abnormality in lamp fan lighting, the flow chart view of drawing 8 is made reference, and is mentioned later in detail.

[0071] In Step 7, in the case of the abnormalities of lamp covering and a filter, the power supply of liquid crystal rear-projection television 1A is turned OFF, and Standby Light Emitting Diode and the BS power supply Light Emitting Diode are blinked with the period of 1Hz (Steps ST8 and ST9). This lamp covering and the abnormalities in a filter are the cases where a user removes. In this case, it will become normal if a user re-equips.

[0072] There is a life in a lamp 24, and when it goes out, the abnormalities of lamp covering are designed so that a user can exchange, as mentioned above. That is, it has the structure of exchanging the unit which opens covering of a lamp 24 and consists of a lamp house 22. Even if it is after wearing in the case of exchange of this lamp house 22, lamp covering malfunction detection detects whether the protective cover 32 of a lamp 24 has equipped normally.

[0073] Although filter malfunction detection sends in the open air in liquid crystal rear-projection television 1A by the fan 44 and cools, if it also sends dust and dust in a set simultaneously with the open air, it will become a poor cause. Therefore, a filter 34 is installed and it is made to eliminate dust and dust. If it does so, dust and dust are accumulated with the passage of time at a filter 34, and it will become bad as it is the open air. Therefore, it is necessary to remove a filter 34 periodically and to clean dust and dust. Thus, filter malfunction detection detects that the filter 34 is removed. Also about this abnormality in a filter, the flow chart view of drawing 11 is made reference, and is mentioned later.

[0074] Next, about the abnormalities in a lamp which gave [ above-mentioned ] explanation non-switched on the light, further, the flow chart view of drawing 10 is made reference, and is explained.

[0075] That is, when the abnormalities in a lamp non-switched on the light are detected in the system microcomputer 60 (refer to drawing 8), "lamp lighting" is carried out to the end (step ST 11).

[0076] And if it is in the middle of processing "containing a power supply" and is not the middle of the waiting for 15 second, and "entering a power supply", it will wait for 30 seconds (Steps ST13 and ST14).

[0077] Again, the system microcomputer 60 turns ON "lamp lighting", and waits only for for 5 seconds (Steps ST15

and ST16).

[0078] And since it is unusual lamp un-switching on the light in the case of the abnormalities in a lamp non-switched on the light, the power supply of the set which is liquid crystal rear-projection television 1A is made the end (Steps ST17 and ST18).

[0079] Thus, when lamp the abnormal condition non-switched on the light is detected, it may not be the life of a lamp, and it is made to perform re-starting of the current supply of a lamp 24 without performing the power supply end immediately since it may be based on the hits of a power supply etc., when it will be in lamp the abnormal condition non-switched on the light during operation.

[0080] Next, about the abnormalities in a filter, the flow chart view of drawing 11 is made reference, and is explained. Detection of the abnormalities in a filter judges first that it is the inside of videotape-recording mode, for example, BS videotape-recording mode, (Steps 20 and 21).

[0081] In in BS videotape-recording mode, power supplies other than BS power supply of a set are made the end (step ST 22).

[0082] In not being among BS videotape-recording videotape-recording mode, it makes the power supply of all sets the end (step ST 23).

[0083]

[Effect of the Invention] By the visual equipment equipped with the abnormal-condition detection mechanism concerning this invention shutting off a power supply fundamentally, when an abnormal condition is detected, as explained above, and having changed the method of presentation according to the kind of abnormal condition, the performance of a visual equipment is maintained and there is an effect which says that a suitable measure can be made to perform by the user side.

[0084] Moreover, re-starting operation of a lamp performs, even if it is operation by the life of a lamp etc. non-switched on the light, can make the light switch on in the case of the abnormalities in a lamp, and in liquid-crystal rear-projection television, there is an effect referred to as being able to raise the performance quality of the liquid-crystal rear-projection television itself in it by being made giving an indication which is different about the abnormalities in temperature, the abnormalities in a fan, the abnormalities in a lamp non-switched on the light, and the abnormalities in a

[0085] Furthermore, at the time of the abnormalities in a filter, when a visual equipment is recording on videotape, there is an effect which says that it can be made to drive, without spoiling the potential function of a visual equipment by having made it not turn off only a power supply required for videotape recording.

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[Translation done.]

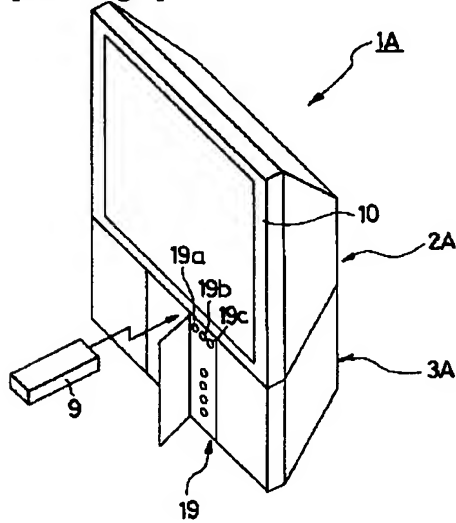
## \* NOTICES \*

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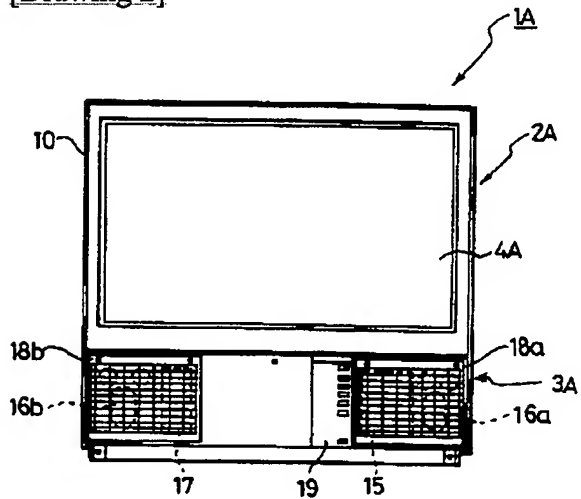
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

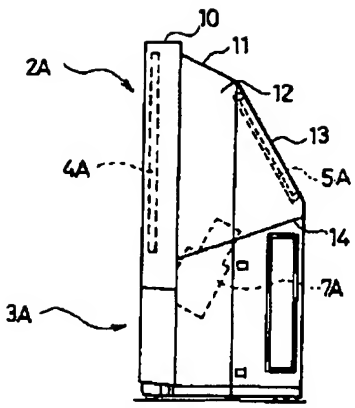
[Drawing 1]



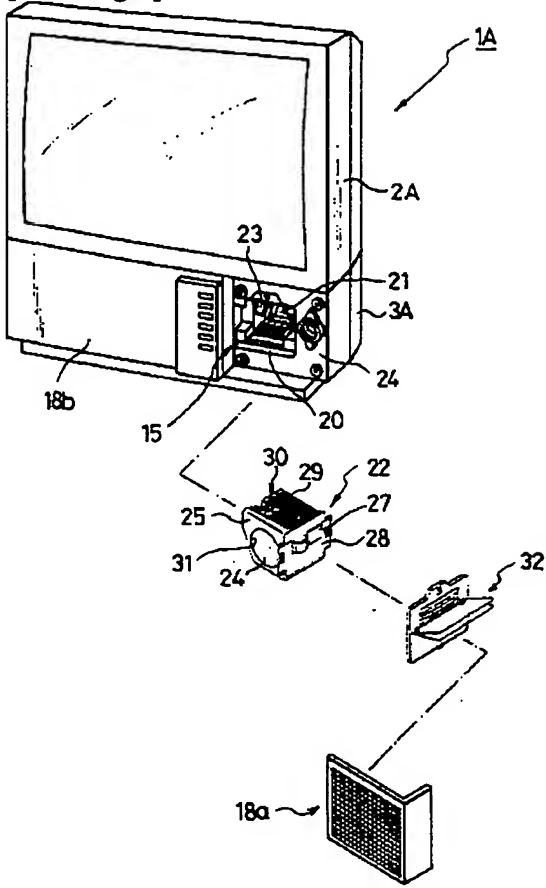
[Drawing 2]



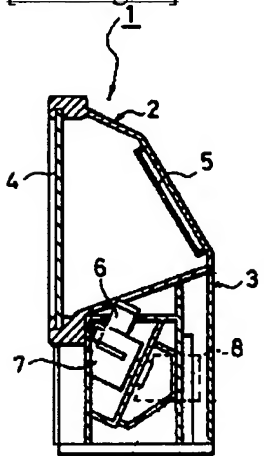
[Drawing 3]



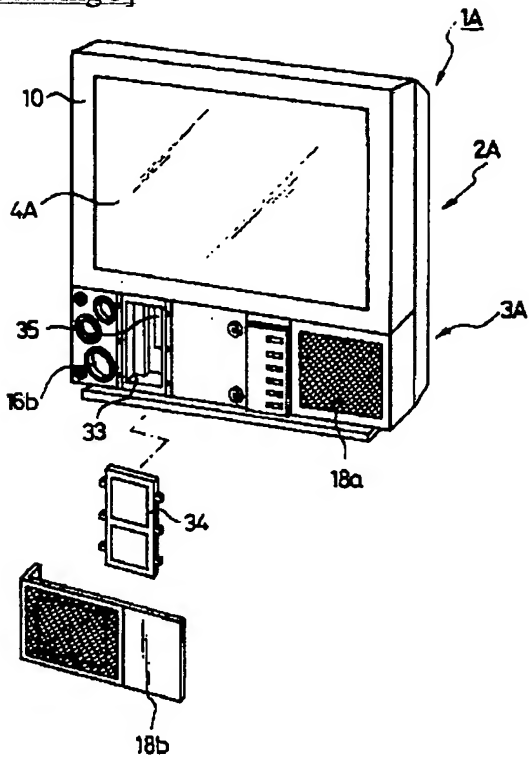
[Drawing 4]



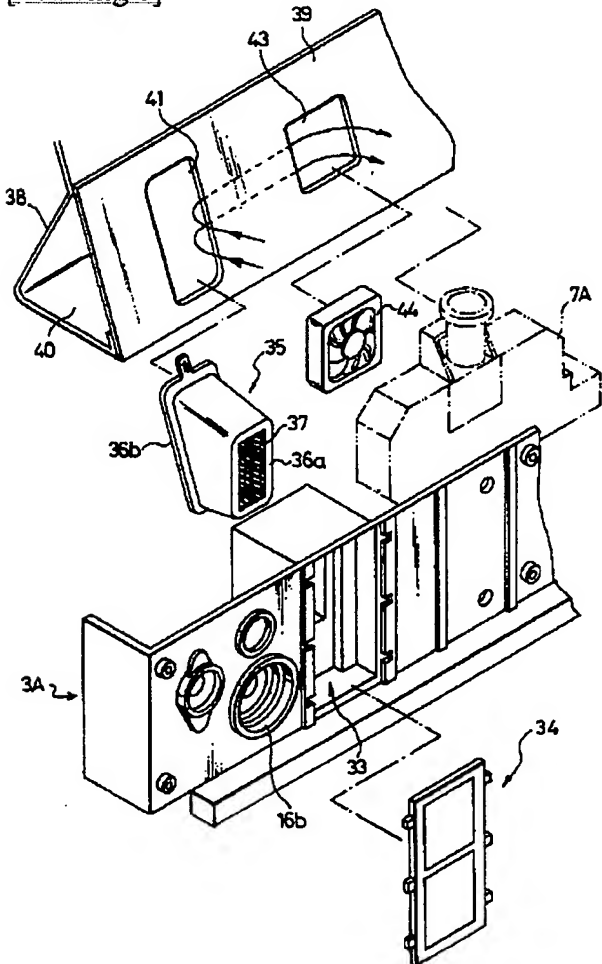
[Drawing 12]



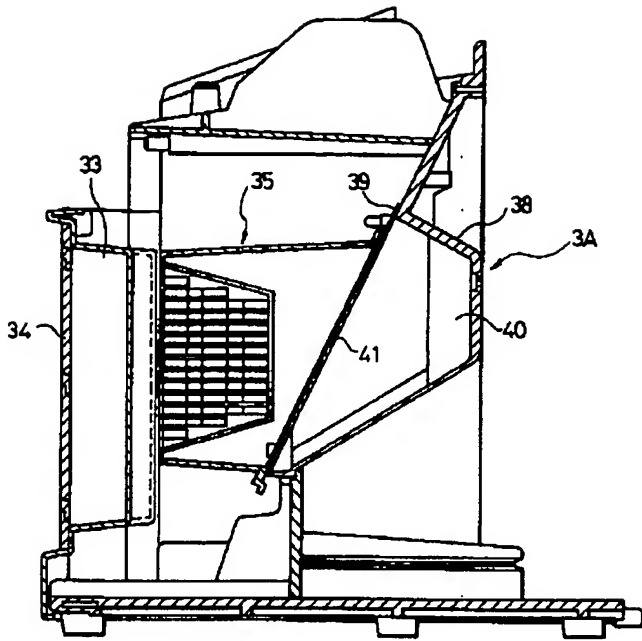
[Drawing 5]



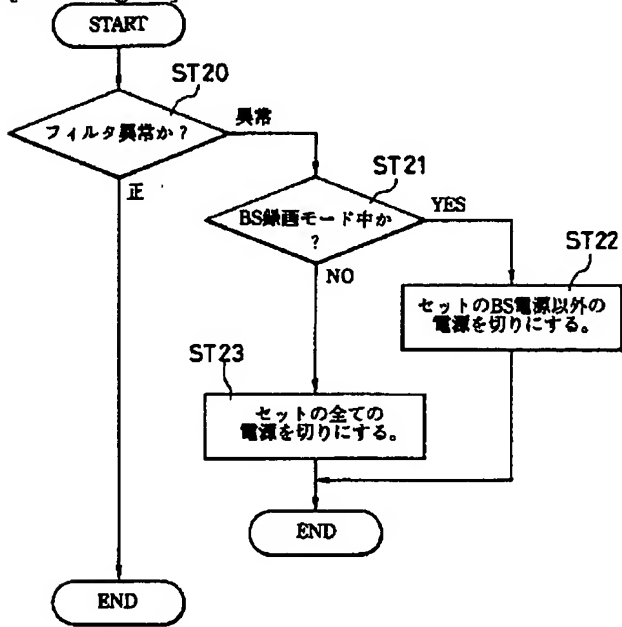
[Drawing 6]



[Drawing 7]

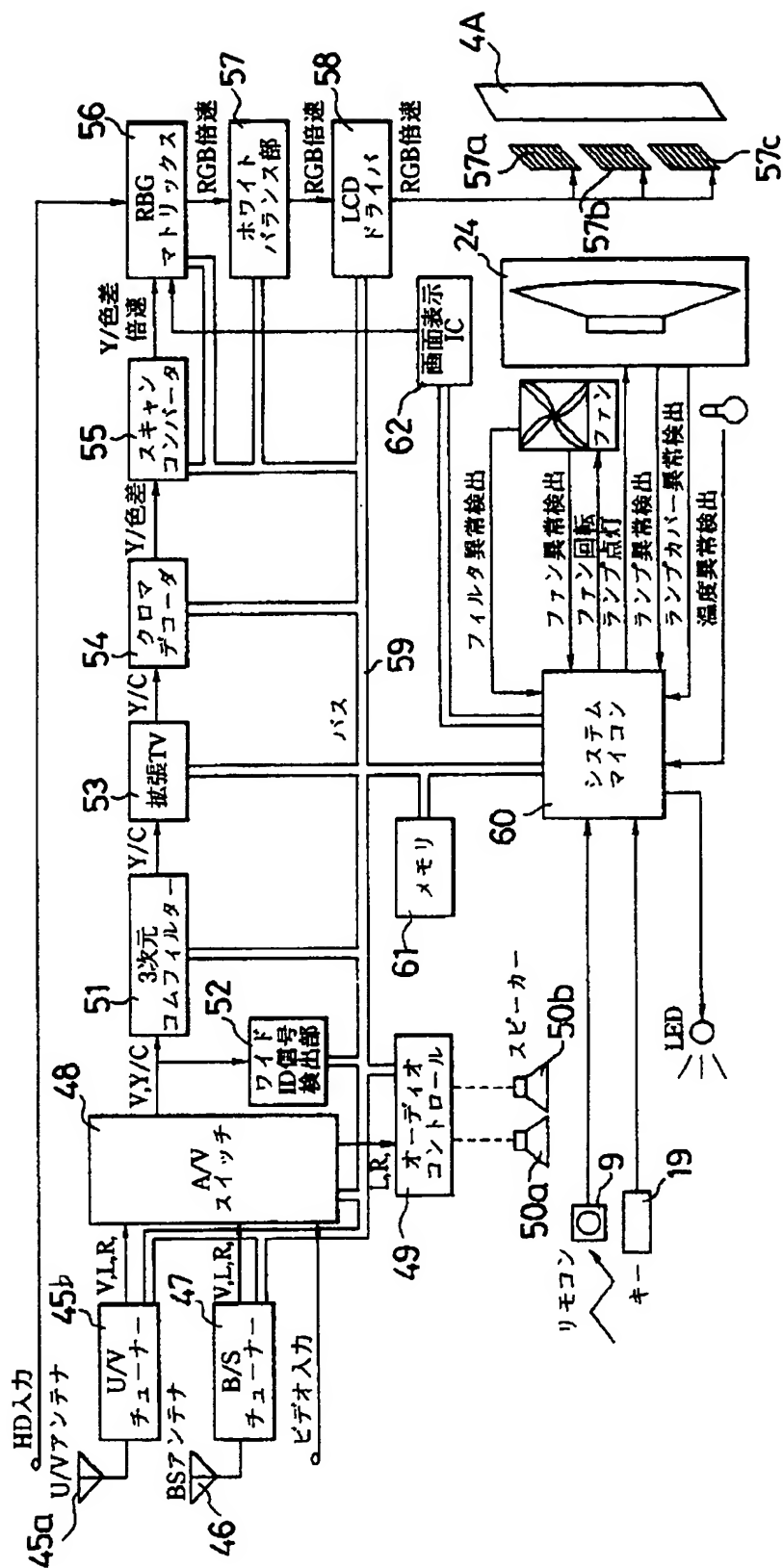


[Drawing 11]

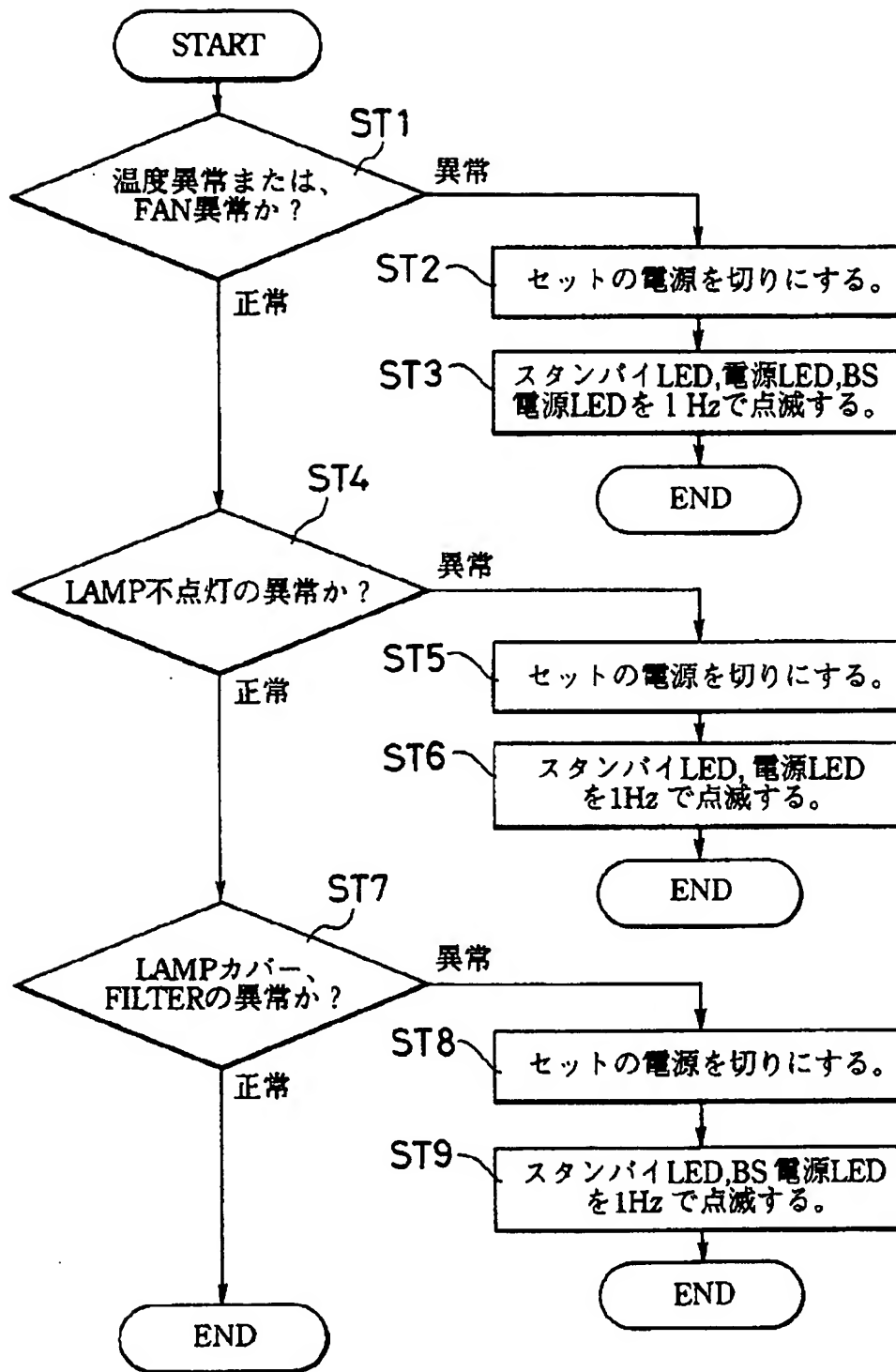


[Drawing 8]

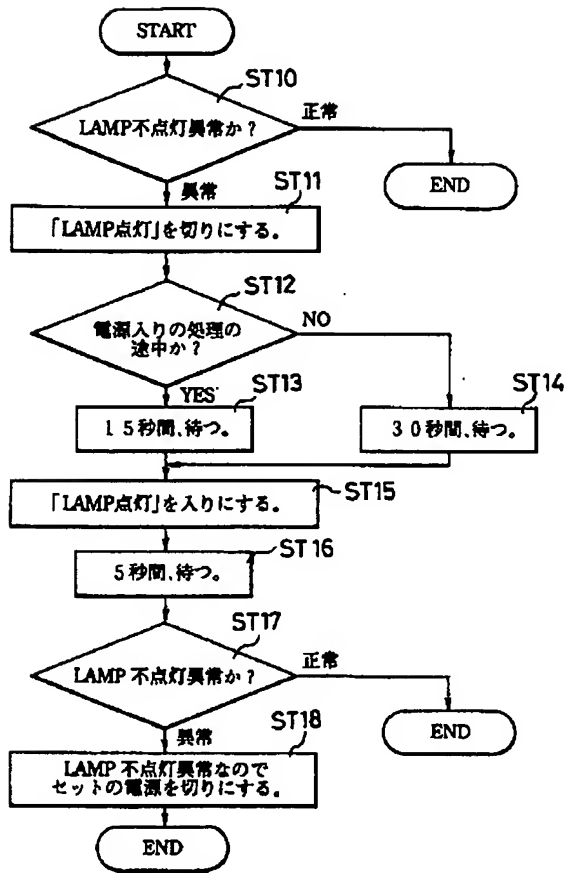




[Drawing 9]



[Drawing 10]



[Translation done.]